

CLAIMS

1. An adaptive control method in real-time communication, comprising:

- 5 a first step of making arrangement for a transmission interval of a receiver report packet to be transmitted to a data transmission apparatus by a data reception apparatus between the data transmission apparatus and the data reception apparatus before starting transmission and reception of real-time data;
- 10 a second step of the data transmission apparatus monitoring reception conditions of the receiver report packet in a unit of the arranged transmission interval after starting transmission and reception of the real-time data; and
- a third step of the data transmission apparatus adaptively
- 15 controlling data transmission based on a monitoring result.

2. The adaptive control method in real-time communication according to claim 1, wherein the transmission interval of the receiver report packet in the first step is a fixed interval

20 or a tolerable maximum interval;

 in the second step, based on information of number of times of failed receptions of a receiver report packet within the transmission interval or within an interval of the transmission interval plus a delay time of a transmission path, an occurrence

25 of congestion in the communication path, an occurrence of a transmission error in the communication path, or an inability of communication with the reception apparatus is estimated; and

in the third step, a control for either data transmission rate change or data transmission stop is performed.

3. The adaptive control method in real-time communication
5 according to claim 1, wherein a connection-oriented transport scheme having a high reliability is used for the arrangement of the transmission interval in the first step, whereas a connection-less type transport scheme is used for transmission and reception of the real-time data.

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4. A method for taking measures against consecutive loss of receiver report packets in real-time communication, comprising the steps of:

either a data transmission apparatus or a data reception
15 apparatus notifying the apparatus at other end a transmission interval of a receiver report packet to be transmitted by the data reception apparatus to the data transmission apparatus before starting transmission and reception of data by utilizing a control signal at the time of session establishment and thereby
20 obligating the data reception apparatus to transmit a receiver report packet at least once within the transmission interval after starting transmission and reception; and

the data transmission apparatus monitoring the reception
conditions of the receiver report packet sent from the data
25 reception apparatus in a unit of an interval of the transmission interval or an interval of the transmission interval plus a delay time of a transmission path, and performing adaptive control

for either data transmission rate change or data transmission stop in a case where consecutive loss of the receiver report packets arise.

- 5 5. A dynamic determination apparatus for a transmission interval of a receiver report packet, comprising:

 a transmission interval determination section that dynamically determines a transmission interval of a receiver report packet in real-time communication; and

- 10 a transmission section that transmits the determined transmission interval to an apparatus at other end of communication using a connection-oriented transport scheme having a high reliability.

- 15 6. An adaptive control apparatus in real-time communication, comprising:

 a monitoring section that monitors reception conditions of the receiver report packet in a unit of a transmission interval determined by the dynamic determination apparatus for the transmission interval of the receiver report packet according to claim 5 after starting transmission and reception of the real-time data; and

 an adaptive control section that controls data distribution adaptively based on a monitoring result.

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7. A data reception apparatus for receiving media data distributed via a communication network to replay audio and video,

the apparatus comprising:

a transmission interval determination section that determines an transmission interval of a receiver report packet;

5 a control information transmission and reception section that notifies the determined transmission interval information to other end of communication using a connection-oriented communication protocol;

a receiver report packet generation section; and

10 a receiver report packet transmission section that transmits the receiver report packet at least once within the transmission interval.

8. The data reception apparatus according to claim 7, wherein the transmission interval of the receiver report packet is a
15 fixed interval or a tolerable maximum interval.

9. The data reception apparatus according to claim 7 or 8, wherein the data reception apparatus is a mobile device having a communication function.

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10. A data distribution apparatus for distributing real-time data via a communication network, comprising:

a transmission interval determination section that determines an transmission interval of a receiver report packet
25 transmitted by an distribution end apparatus to the data distribution apparatus;

a control information transmission and reception section

that is able to notify the determined transmission interval information to other end of communication using a connection-oriented communication protocol; and

5 a data distribution section that distributes the real-time data using a connection-less type communication protocol.

11. A data distribution apparatus for distributing real-time data via a communication network, comprising:

10 a timer for measuring the elapsing of a transmission interval of a receiver report packet, which is notified by an apparatus at distribution end or is determined by the apparatus itself;

15 a counter that counts number of times of failed receptions of the receiver report packet within the transmission interval or within an interval of the transmission interval plus a delay time of a transmission path; and

20 an adaptive control section in real-time communication that compares a counter value of the counter with one or more threshold, and based on a comparison result, lowers transmission rate of the real-time data or disconnects session.

12. A mobile terminal apparatus which receives media data containing either audio data or video data from a media distribution server via a wired and wireless communication network and has a playback function, the apparatus comprising:

25 a receiver report packet transmission interval arrangement section that transmits information related to an interval for

transmitting a receiver report packet determined by itself or receives information sent from the media distribution server related to an interval at which the receiver report packet should be transmitted at a stage of establishing a session with the
5 media distribution server; and

a receiver report packet transmission section that transmits a receiver report packet to the media distribution server in accordance with the information related to the interval.